Space Weather Forecast

Issued on Thursday, 21 April 2022 at 13:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Slight chance Strong flares (R3 Radio Blackouts), with further Moderate flares (R1/R2 Radio Blackouts) likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is currently Moderate due to two Moderate-flares observed in the last 24 hours, the strongest of which was just below the level of being classed a Strong flare, and occurred overnight from the northernmost sunspot group in the large complex area of sunspots in the northeast. These sunspots have produced a strong flare before, on the 17th, and further such flares are possible with these still showing signs of evolution and only slight indications of decay in one component sunspot. There are a number of other smaller sunspots on the disc, however these are all smaller and less active. A potentially Earth-glancing coronal mass ejection (CME) was released from the stronger of the two Moderate flares, however this needs further analysis.

Solar Wind / Geomagnetic Activity: The solar wind speed has persisted around 400 km/s with the Interplanetary Magnetic Field carried by this wind largely weak throughout. However a small enhancement was observed after 21/1100 UTC, with the important north-south component of the field also becoming negative (southward pointed). Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Moderate over the next four days, with a chance of Strong flares, mainly from the large and fairly complex regions currently in the northeast quadrant of the Sun. There is on ongoing likelihood of Moderate flares.

Solar Wind / Geomagnetic Activity: The CME from the Moderate flare has the potential to glance Earth on the 24th (day 4), however this is low confidence with further analysis likely. Solar winds have the potential to be slightly elevated day 1 (21st) before easing to background, before the next enhancement is possible day 4 (24th) from the arrival of the fast winds from a coronal hole. Geomagnetic activity is likely to Quiet with isolated Unsettled intervals, and a slight chance of Active intervals each day. Activity increasing to Unsettled to Active with a chance of G1 Minor storms, with any CME glance that occurs day 4 (24th), although this is currently low confidence.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring. However the risk of solar radiation storms, whilst remaining very low, will increase as the complex sunspot regions move westwards across the disc through the period, and into a greater risk region for effecting the Earth should they produce any particle rich flares.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.

Met Office

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	7	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2022. All Rights Reserved.